

REMARKS

Claims 1-5, 7-9, 12-13, and 15-25, as amended, and new claims 26-28 are pending in this application. In this Response, Applicants have amended certain claims because Applicants believe these amendments serve a useful clarification purpose, and are desirable for clarification purposes, independent of patentability. Accordingly, Applicants respectfully submit that the claim amendments do not limit the range of any permissible equivalents.

In particular, independent claim 1 has been rewritten to further clarify that the golf ball core is formed of a polymeric composite that includes at least two polybutadienes and a plurality of nanoparticles, which is supported by the present Specification (Page 8, lines 24-25 and Page 9, lines 1-3 and 10-11). Dependent claims 2-5, 7-9, 12, and 15 have been amended in light of the changes to claim 1 and the various claim cancellations. New independent claim 26 has been added to recite an invention similar to independent claim 1, with a core coefficient of restitution requirement, which is supported by the present Specification at page 5, lines 15-16. As no new matter has been added by the amendments herein, Applicants respectfully request entry of these amendments at this time.

Brief Description of the Present Invention

As explained in the previous Response filed March 12, 2003, it is well understood that there is great difficulty in blending certain polymer materials having different microstructures. Specification at Page 4, lines 6-10. Thus, the present invention's combination of polymers and nanoparticles while in solution advantageously facilitates and improves the mixing of the polymers, providing properties unobtainable using conventional mixing or polymerization techniques. *Id.* at Page 10, lines 22-24.

As provided in the present Specification, the final product after solution blending is different from the final product obtained through conventional methods. In fact, Example 19 demonstrates the vast difference between a polymeric composite of the present invention and a polybutadiene composition obtained by conventional methods using the same or substantially similar materials (Specification at Page 23, lines 1-29). Example 19 compares a core formed from a polymeric composite of the present invention (Specification at Page 22, lines 1-35, Example 4: core formed from solution blended combination of nickel-catalyzed polymer, a cobalt-catalyzed polymer, and nanocomposites) to a core formed from a conventionally prepared cis-polybutadiene and trans-polyisoprene blend. While the core compression was similar for both, the coefficient of restitution (COR) for the core formed

from the solution blended polymeric composite of the present invention was much higher than the conventionally formed core (Specification at Page 24, lines 20-21). In fact, the COR of the present invention core was 0.807, which is close to the USGA limit for COR, while the comparative example core (made with conventional blending techniques) was 0.790. As known to those of ordinary skill in the art, a difference in COR of about 0.01 or greater has a drastic effect on the performance of a golf ball. Thus, solution blending according to the present invention does produce a different final product than conventional blending.

In addition, solution blending of resilient polymer components and nanoparticles provides an added benefit over conventionally formed resilient polymer compositions that include nanoparticles. For example, simultaneous solution blending of the polybutadiene and nanoparticles (as opposed to adding the nanoparticles at a later stage after solution blending of the polybutadienes or conventional mixing of the polybutadienes and nanoparticles), results in a more uniform dispersion of the nanoparticles throughout the composite. In contrast, conventional blending of resilient polymer components and nanoparticles is known to produce compositions with a less uniform dispersion of nanoparticles.

In further support of this position, Applicants submit herewith a Declaration of Laurent C. Bissonnette Under 37 C.F.R. § 1.132 ("the Bissonnette Declaration") to clarify the above-referenced advantages of a solution blended polymeric composite of the present invention over that of a conventionally prepared resilient polymer composition.

THE REJECTIONS UNDER 35 U.S.C. §§ 102 and 103

Rejection Based Upon Toshiya

Claims 1-3 and 5-9 were rejected under 35 U.S.C. § 102(h) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Japanese Patent No. 03-106380 to Toshiya *et al.* of Yokohama Rubber Co. as set forth on page 2 of the Office Action.

Toshiya generally discloses polybutadiene compositions for solid golf balls. See Abstract. Because Toshiya is completely silent as to non-conventional methods for forming the polybutadiene compositions, a skilled artisan would have no reason to assume that Toshiya intended to depart from conventional methods of forming rubber-based compositions, e.g., combining ingredients using roll mills and/or internal mixers.

In contrast, the present invention is directed to a solution blended polymeric composite, which is formed from a non-conventional method of combining polymers. As discussed above, solution blending of polymers does result in a final product that is different

from that of a conventionally blended polymer product, such as that disclosed in Toshiya. In fact, a core formed from a solution blended polymeric composite of the present invention results in a product with a much higher COR (Specification at Page 24, lines 1-29; Bissonnette Declaration) when compared to a core formed from the same or substantially similar composition that has been produced via conventional blending methods.

In addition, the solution blended polymeric composite of the present invention has a more uniform dispersion of nanoparticles as a result of the solution blending (Specification at Page 9, lines 14-15; Bissonnette Declaration), whereas the conventionally blended polymer composition is not known to have a uniform dispersion of nanoparticles. As explained in the Bissonnette Declaration, it is believed that the more uniform dispersion of nanoparticles will result in a more durable, more resilient material. (Bissonnette Declaration at ¶ 10).

Thus, because Toshiya is completely silent as to the solution blended polymeric composite presently recited in the pending claims, Applicants respectfully submit that this reference does not anticipate the product being claimed by the present invention. Furthermore, a skilled artisan would have no motivation to use non-conventional methods for forming the disclosed polybutadiene compositions in Toshiya without the use of improper hindsight.

For at least these reasons, Applicants respectfully submit that Toshiya does not anticipate or render obvious the present invention. Thus, Applicants respectfully request reconsideration and withdrawal of the rejection based on Toshiya.

Rejection Based Upon Sullivan '637

Claims 1-3 and 5-9 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,387,637 to Sullivan as set forth on page 2 of the Office Action. Sullivan '637 does not disclose or suggest the present invention for the reasons that follow.

Sullivan '637 generally discloses polybutadiene compositions for core construction that are formed by intimately mixing the ingredients by using roll mills or internal mixers at temperatures of about 200°F and higher until the composition is uniform. See, e.g., Abstract and Col. 12, lines 55-68. Sullivan '637 is completely silent, however, as to the solution blended polymeric composite of the present invention. As discussed above, a core formed by solution blending according to the present invention has tangible differences from a core formed according to the conventional method taught by Sullivan.

In addition, as stated by the Examiner, Sullivan '637 teaches silica particles of 2000 nm to 6200 nm (Col. 4, line 38). In contrast, claim 1 of the present invention now recites that particle size previously recited in claim 6, i.e., about 100 nm or less. Because Sullivan is silent as to the nanoparticles presently claimed, Sullivan '637 does not anticipate the present invention. A skilled artisan would also not have been motivated to use particles with smaller sizes than taught by the Sullivan '637 patent because the Sullivan '637 patent explicitly teaches that only "specific crystalline silica filler materials produce higher COR values than a number of other organic fillers." Col. 5, lines 21-24. Sullivan goes on to state that "this was surprising and unexpected due to the great number of fillers that the inventors have investigated in the past that produced poorer performance." Col. 5, lines 25-31. The specific fillers provided in the Sullivan '637 patent focus on a broad range of particle sizes (about 1 micron to about 18 microns), which are all larger than the nanoparticles included presently claimed invention. See Col. 5, line 65 to Col. 6, line 2. Because of the specificity of the Sullivan '637 patent with regard to the fillers and sizes thereof, one of ordinary skill in the art would not have been motivated to use particles with sizes outside of the ranges provided.

Thus, for at least the reasons above, Applicants respectfully submit that Sullivan '637 does not anticipate or render obvious the present invention. Therefore, Applicants respectfully request that the rejection based upon Sullivan '637 be reconsidered and withdrawn.

Rejection Based Upon Walker '272

Claims 1-3 and 5-7 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,666,272 to Walker *et al.* as set forth on pages 2-3 of the Office Action. Walker '272 does not disclose or even suggest a solution blended polymeric composite, as presently recited, for the reasons below.

The Walker '272 method of combining the polybutadiene composition ingredients is similar, if not identical, to the conventional method taught by Sullivan '637. For example, the Walker '272 method involves the use of polymers that have been separately polymerized and stripped of solvent before mixing in a Banbury mixer or two-roll mill (Col. 1, lines 36-49 and 62-64). And, as discussed above, a core formed from the solution blended polymeric composite of the present invention has superior properties over that of a core formed from conventional methods, such as those disclosed in Walker '272.

Thus, the Walker '272 patent does not disclose or even suggest the core product of the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

Rejection Based Upon Schweiker '238

Claims 1-3 and 5-10 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,974,238 to Schweiker *et al.* as set forth on page 3 of the Office Action. For similar reasons as discussed above with respect to Sullivan '637 and Walker '272, Schweiker '238 also does not disclose or suggest the presently recited solution blended polymeric composite.

The Examiner stated that Schweiker's composition is indistinguishable from the presently recited solution blended polybutadiene compositions. Because Schweiker's composition is produced via conventional blending techniques, Applicants respectfully disagree that Schweiker's composition would result in the same product as presently claimed. In particular, as provided in the Bissonnette Declaration, a conventional method of blending polybutadiene results in a core having a lower COR and non-uniform dispersion of nanoparticles as compared to a core formed with the solution blended composite of the present invention. (Bissonnette Declaration).

Moreover, Schweiker '238 teaches conventional blending of a polybutadiene and unsaturated carboxamide (Col. 2, lines 5-12). In contrast, the present invention recites a solution blended composite including at least two polybutadienes and a plurality of nanoparticles.

Thus, Applicants respectfully submit that Schweiker '238 does not disclose or suggest the presently recited solution blended polymeric composite of the present invention. Applicants respectfully request reconsideration and withdrawal of the rejection based thereon.

Rejection Based Upon Ihara '381

Claims 1-3, 5, 8, and 11 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 4,840,381 to Ihara *et al.* as set forth on page 3 of the Office Action.

Like the cited references discussed above, Ihara '381 is also directed to polybutadiene compositions formed by conventional mixing processes. While not expressly recited in Ihara

'381, skilled artisans are aware that preparation of polybutadiene threads involves conventional blending methods, such as blending in a Banbury mixer. Ihara '381 is completely silent as to unconventional methods of forming the thread rubber. As such, one skilled in the art would have no reason to depart from conventional methods of forming thread rubber traditionally used in wound golf balls. As discussed above, a conventional method of forming polybutadiene compositions, as suggested in the Ihara '381 patent does not result in the core product presently claimed.

For these reasons, Applicants respectfully submit that Ihara '381 does not disclose or suggest the present invention. As such, Applicants respectfully request that the rejection based on Ihara '381 be reconsidered and withdrawn.

Rejection Based Upon Dalton

Claims 1-3, 5, 8, and 10 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over European Patent No. 0 613 700 to Dalton *et al.* of Acushnet Co. as set forth on page 3 of the Office Action.

Similar to the cited references discussed above, Dalton is also directed to conventional methods of forming polybutadiene compositions for golf balls. Because Dalton does not even suggest using non-conventional methods of forming the disclosed rubber-based compositions, a skilled artisan would have no reason to assume that non-conventional methods may be used to form the compositions provided in Examples 26-28. And, as discussed above, the solution blended polymeric composite of the present invention produces a core with different properties than one formed using Dalton's conventional methods.

Therefore, Applicants respectfully submit that Dalton does not anticipate or render obvious the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

Rejection Based Upon Hamada

Claims 1-3, 5, and 8-9 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 5,082,285 to Hamada *et al.* as set forth on page 4 of the Office Action.

As stated by the Examiner, Hamada generally discloses mixing polybutadienes in solution form (Col. 2, lines 13-15). However, Hamada is completely silent as to solution blending of at least two polybutadienes with a plurality of nanoparticles as presently recited

in independent claim 1. While Hamada does generally teach that fillers may be included in the rubber composition, Hamada does not even suggest that these fillers are nanoparticles as presently recited. *See* Col. 2, lines 54-60. As such, one of ordinary skill in the art would not have modified Hamada's composition with a plurality of nanoparticles without the present invention to use as a template, which is a classic case of impermissible hindsight.

Furthermore, Hamada is silent on the inclusion of fillers in solution as recited in the present claims. Instead, Hamada only teaches that the rubber composition is generally mixed in a Banbury mixer or the like (Col. 2, lines 61-66). Therefore, as reasonably interpreted from the disclosure, Hamada teaches to blend two polybutadienes in solution and then mix the resulting base rubber, crosslinking agent, co-crosslinking agent, and fillers using conventional blending techniques. *See* Col. 2, lines 13-16 and 54-66. As discussed above and in the Bissonnette Declaration, conventional blending of resilient polymer components and nanoparticles would result in a different product than presently claimed.

Therefore, Applicants respectfully submit that Hamada does not anticipate or render obvious the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

Rejection Based Upon Crouch

Claims 1-3, 8, and 10 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,213,160 to Crouch as set forth on page 4 of the Office Action.

Crouch generally discloses golf ball cover stocks formed from a blend of trans-polyisoprene and trans-polybutadiene (Col. 1, lines 56-61 and Col. 2, lines 10-15). Crouch is completely silent, however, as to solution blends of polybutadienes as presently recited. In addition, Crouch does not disclose or suggest the use of nanoparticles. Moreover, Crouch's compositions are for use in the cover (Col. 2, lines 10-15), not in the core, as presently recited. It would not have been obvious to a skilled artisan to modify the Crouch disclosure to add nanoparticles via solution blending, as presently claimed, without the use of improper hindsight.

Therefore, Applicants respectfully submit that Crouch does not anticipate or render obvious the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

Rejection Based Upon Kohrn

Claims 1 and 8-9 were rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 3,238,156 to Kohrn as set forth on page 4 of the Office Action.

Kohrn generally discloses an impact resilient golf ball component formed from a blend of elastomer and microballoons. See Col. 1, lines 50-69. While Kohrn does generally disclose solution blending of the elastomer with another material (Col. 3, lines 60-71), Kohrn is completely silent as to the use of nanoparticles having a particle size of less than about 100 nm as now recited in independent claim 1. In fact, Kohrn teaches microballoons of about 1 to 1000 microns in diameter (Col. 4, lines 33-34), which are much larger than the nanoparticles of the present invention. One of ordinary skill in the art would also not be motivated to use microballoons with a smaller diameter than disclosed by Kohrn without the present invention to use as a template, which is, of course, a classic case of improper hindsight.

Thus, Applicants respectfully submit that Kohrn does not disclose or suggest the present invention. Thus, Applicants respectfully request that the rejections based thereon be reconsidered and withdrawn.

Rejection Based Upon GB 1,026,254 in view of Sandstrom

Claims 1-3 and 8-10 were rejected under 35 U.S.C. § 103(a) as obvious over Great Britain Patent No. 1,026,254 in view of U.S. Patent No. 5,753,761 to Sandstrom *et al.* as set forth on pages 4-5 of the Office Action.

As stated by the Examiner, GB 1,026,254 generally discloses a core formulation of *cis*-1,4-polybutadiene and *trans*-1,4-polyisoprene that is blended on a roll rather than in solution (Office Action at Page 5). In an attempt to cure this deficiency, the Examiner uses Sandstrom's disclosure of solution blending in relation to rubber tire compositions in combination with GB 1,026,254 as prior art against the presently claimed invention. However, the invention now recited in claim 1 recites a solution blended polymeric composite of at least two polybutadienes and nanoparticles. Neither GB 1,026,254 nor Sandstrom disclose or even suggest a golf ball core formed from a solution blended polymeric composite including at least two polybutadienes and nanoparticles.

For at least these reasons, no combination of GB 1,026,254 and Sandstrom anticipates or renders obvious the present invention. As such, Applicants respectfully request reconsideration and withdrawal of the rejection based thereon.

Rejection Based Upon Bissonnette in view of Sandstrom

Claims 1-3, 5, and 8-10 were rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,093,357 to Bissonnette *et al.* in view of Sandstrom as set forth on page 5 of the Office Action.

Bissonnette generally discloses three layer golf balls having an outer core layer or inner cover layer formed from a rubber-based composition. *See Abstract.* As recognized by the Examiner, Bissonnette does not disclose or even suggest solution blending of two polybutadienes (Office Action at Page 5). In addition, Bissonnette is completely silent as to the use of nanoparticles in the rubber-based composition.

As above, the Examiner relies on the Sandstrom patent in an attempt to cure the Bissonnette deficiencies. No combination of Bissonnette and Sandstrom, however, will result in the presently claimed solution blended polymeric composite of at least two polybutadienes and nanoparticles. Sandstrom does not even suggest using the compositions therein for golf balls, and also does not suggest the use of nanoparticles. Therefore, even if there were motivation to combine the references, *arguendo*, the result of the combination would not anticipate or render obvious the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

Rejection Based Upon Walker in view of Sandstrom

Claims 1-3 and 5-7 were rejected under 35 U.S.C. § 103(a) as obvious over Walker in view of Sandstrom as set forth on page 6 of the Office Action.

As discussed above, Walker does not disclose or even suggest the present invention. In fact, as recognized by the Examiner, the Walker '272 patent is completely silent as to the solution blended polymeric composite presently claimed. As above with GB 1,026,254 and Bissonnette, the Examiner cited Sandstrom in an attempt to cure the deficiencies of Walker. However, as discussed above, a core formed from the solution blended polymeric composite of the present invention has superior properties over that of a core formed from conventional methods, such as those disclosed in Walker '272. Therefore, no combination of Walker and Sandstrom would result in the presently claimed invention.

Therefore, Applicants respectfully submit that no combination of Walker and Sandstrom results in the present invention. As such, Applicants respectfully request that the rejection based thereon be reconsidered and withdrawn.

ATTORNEY DOCKET NUMBER

Applicants submitted a Revocation and Power of Attorney on March 13, 2002 for which a Notice of Acceptance was mailed October 9, 2002. While it appears that the new correspondence address has been entered, the attorney docket number has not been changed from 174-934 to 20002.0092. Applicants request that the change in attorney docket number be recorded and acknowledged.

CONCLUSION

All claims are believed to be in condition for allowance. If the Examiner believes that the present amendments still do not resolve all of the issues regarding patentability of the pending claims, Applicants invite the Examiner to contact the undersigned attorneys to discuss any remaining issues.

No fees are believed to be due at this time. Should any fee be required, however, please charge such fee to Swidler Berlin Shereff Friedman, LLP Deposit Account No. 195127, Order No. 20002.0092.

Respectfully submitted,

SWIDLER BERLIN SHEREFF FRIEDMAN, LLP

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